P01802WO

CLAIMS

1. A dual mass clutch flywheel that is able to rotate about a main axis of rotation and comprises two masses and a torsional vibration damper, which is capable of damping rotary vibrations by means of a spring damper device acting between the two masses, with a spring system and a damper system, wherein, in a load-free condition, both masses are able to rotate in an idling position about the main axis of rotation, and in the loaded condition are able to rotate against the spring-damper device about a main axis of rotation, offset by a relative angle to each other, wherein the spring system has springs which are guided by hold-down devices radially to the main axis of rotation, which devices are connected to each other by means of a fly ring, wherein the fly ring is freely able to follow the springs at least over a small relative idling angle around the idling position, and wherein the springs are freely mounted, at least in the region of the hold-down device, characterised in that the springs are connected in series by means of the hold-down device (136, 236).

2. A dual mass clutch flywheel that is able to rotate about a main axis of rotation and comprises two masses and a torsional vibration damper, which is capable of damping rotary vibrations by means of a spring damper device acting between the two masses, with a spring system and a damper system, wherein, in a load-free condition, both masses are able to rotate in an idling position about the main axis of rotation, and in the loaded condition are able to rotate against the spring-damper device about a main axis of rotation, offset by a relative angle to each other, wherein the spring system has rectilinear springs which are guided by hold-down devices

radially to the main axis of rotation, which devices are connected to each other by means of a fly ring, wherein the fly ring is freely able to follow the springs at least over a small relative idling angle around the idling position, and wherein the springs are freely mounted, at least in the region of the hold-down device, characterised in that the springs are connected in series by means of the hold-down device (136, 236).

3. A dual mass clutch flywheel that is able to rotate about a main axis of rotation and comprises two masses and a torsional vibration damper, which is capable of damping rotary vibrations by means of a spring damper device acting between the two masses, with a spring system and a damper system, wherein, in a load-free condition, both masses are able to rotate in an idling position about the main axis of rotation, and in the loaded condition are able to rotate against the spring-damper device about a main axis of rotation, offset by a relative angle to each other, characterised in that the spring system has springs (127; 227; 727; 827) which are connected in series by means of the hold-down device (136, 236) so that under operating conditions they do not rub radially outwards against components (125, 133; 225, 233; 725, 733; 825, 833) performing movements relative to the springs (127; 227; 727; 827).

4. The dual mass clutch flywheel according to Claim 1 or 2, characterised in that the spring system applies less than 20%, in particular less than 10% of the maximum friction of the spring-damper device, compared to a damper system of the spring-damper device.

5. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that the spring system (121; 221; 421) and the damper system (123; 223; 423) of the spring-damper device (119; 219; 419) are arranged on different radii of the main axis of rotation (129; 229, 429).

6. The dual mass clutch flywheel according to Claim 5, characterised in that the damper system (123; 223) is arranged radially outwards.

7. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that plates (125; 233), which transmit torque from one of the two masses (103; 205) to a spring-damper device (119; 219) and are of dual design, consist of identical material with the same strength.

8. The dual mass clutch flywheel according to Claim 7, characterised in that both plates (125; 233) are symmetrical.

9. The dual mass clutch flywheel according to nay one of the preceding claims, characterised in that a flying spring plate (137; 337) consists of identical material, with the same strength, to that of a primary side or secondary side plate (133; 333) which transmits torque from one of the two masses (105) to a spring-damper device (119).

10. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that components on which the springs rest, but from which they are raised in the peripheral direction during a relative movement of the two masses of a dual mass clutch flywheel, expand in the direction of the springs on their side lying radially outwards,

starting from the side lying on the springs, so that they are separated from the springs in the radially outward direction during a relative movement of the two masses on the side on which these components are raised from the springs.

11. The dual mass clutch flywheel according to Claim 10, characterised in that a saddle, on which the springs are able to rest, being guided radially stably, is provided on the side of contact.

12. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that a primary side spring plate (525) is designed as a membrane.

13. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that a component (633) of the secondary mass (605) transmitting a torque in the direction of the primary mass (603) is connected to the secondary plate (605) by means of a riveted joint (635) countersunk in the secondary plate (605).

14. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that the secondary plate (605) is only machined on one side, preferably its side facing the primary mass (603).

15. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that at least one plate (425, 525) transmitting a torque interacts frictionally and directly with a friction element (443, 545).

16. The dual mass clutch flywheel according to Claim 15, characterised in that the plate (425, 625) varies in

the axial direction in a peripheral region in which the friction element (443, 545) can be found.

17. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that the hold-down devices (736, 836) each engage in a spring (727, 827) and/or pass through it from the inside.

18. The dual mass clutch flywheel according to any one of the preceding claims, characterised in that it comprises spring arrangements with a plurality of springs (27, 27A), wherein the inner springs (27A) are of bulbous design.

19. The dual mass clutch flywheel according to any one of the preceding claims, characterised by a friction device, which has at least one frictional surface whose normal vector has an axial component.

20. The dual mass clutch flywheel according to Claim 19, characterised in that the frictional surface is aligned essentially axially.

21. The dual mass clutch flywheel according to any one of the preceding claims, characterised by a friction device which has at least one frictional surface which varies peripherally in the axial direction.

22. The dual mass clutch flywheel according to any one of the preceding claims, characterised by a friction device which comprises at least two wedges (31, 41) which are secured to an axially circulating component, preferably on a pressure plate (44).

23. The dual mass clutch flywheel according to any one of the preceding claims, characterised by a friction device which comprises friction wedges and/or

friction ramps or friction ramp rings of very naturally stiff materials.

24. The dual mass clutch flywheel according to any one of the preceding claims, characterised by a friction device which comprises friction wedges and/or friction ramps or friction ramp rings of friction lining materials.

25. The dual mass clutch flywheel according to any one of the preceding claims, characterised by a friction device with a metal ramp ring (52, 425, 525).

26. A clutch with a clutch flywheel according to any one of the preceding claims, and with a pressure plate and a friction disc that can be gripped by the pressure plate and the clutch flywheel.

27. A method for manufacturing a dual mass clutch flywheel, characterised in that plates (125; 233) which transmit torque from one of the two masses (103; 205) to a spring-damper device (119; 219) and are of dual design are manufactured from one steel plate.

28. The method according to Claim 27, characterised in that the two mouldings of the plates are connected to each other mirror symmetrically.

29. A method for manufacturing a dual mass clutch flywheel, characterised in that a flying spring plate (337) and a primary side or secondary side plate (333), which transmits torque from one of the two masses to a spring-damper device, are manufactured from the identical region of a steel plate (300).

30. The method according to any one of Claims 27 to 29, characterised in that the secondary plate (615), after being cast, is only re-machined on a side facing an engine or the primary mass (603).

31. The method according to any one of Claims 27 to 29, characterised in that when the secondary plate (605) is connected to a component of the secondary mass (605) facing an engine or the primary mass (603), the dimension required is obtained from a point on the secondary plate (605) facing the engine or primary mass (603).